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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : H04M 1/00	A1	(11) International Publication Number: WO 92/05649 (43) International Publication Date: 2 April 1992 (02.04.92)
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Published With international search report.		
(54) Title: CELLULAR TELEPHONE RECORDING ADAPTOR		
(57) Abstract		
<p>An adaptor (10) is disclosed for use with a cellular telephone set having a hand set with a telephone modular plug releasably connected to a telephone modular jack in the telephone set. The adaptor (10) has a housing and an adaptor modular jack (14) mounted in the housing which is adapted to receive the hand set modular plug. A plurality of output ports (40) are electrically connected to the respective pins of the adaptor modular jack (14). A plurality of input ports (36) are electrically connected to respective ones of the plurality of output ports (40). An adaptor modular plug (20) is connected to the input ports (36) and is adapted to be plugged into the telephone set modular jack. A plurality of single pole switches are mounted in the housing. There is one switch for each output port and the switches are divided into first and second sets. Each switch has a first and second side. A plurality of tap lines (42) connect each output port to one side of the switches. A tape jack (16) with two terminals has one terminal connected to the second side of the first set of terminals and the other terminal is connected to the second side of the second set of switches. The plurality of output ports (40) and input ports (36) and the tape jack (16) are also mounted in the housing.</p>		

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CELLULAR TELEPHONE RECORDING ADAPTOR

TECHNICAL FIELD

This invention relates to adaptors for use with telephone sets and more specifically to adaptors for cellular telephones to permit tapping into the telephone signals.

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BACKGROUND ART

In order to enhance the useability of a telephone set, in the past, devices have been developed to attach to a preexisting telephone set. For example, attachments have been provided to permit the recordal of the telephone signals on magnetic tape recorders. These devices normally do not work with cellular telephones, however, and none of them can be used universally with all or even most of the cellular telephones on the market, since cellular telephones have different electrical wiring configurations.

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One example of a telephone signal recording apparatus is shown in U.S. Patent no. 4,446,335 issued on May 1, 1984 to C. E. Lee et al., which shows an apparatus for recording the incoming portion of a telephone conversation. The device is hard wired such that it can only be used with those telephones having predetermined functions for each electrical wire or connection. A particular disadvantage of this prior art device is that it cannot be used with a plurality of different telephones having different electrical wiring configurations. Further, it only records the incoming portion of the telephone call.

It is desirable, particularly with cellular telephones used in cars, to provide a means for taping a telephone conversation, so that the cellular telephone operator need not take notes while using the telephone. Further, there are presently a number of cellular telephones available which have different

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electrical configurations and therefore it is desirable to provide a device which is operable with a plurality of different cellular telephones.

5 The present invention seeks to provide a telephone recording device which can be used with a plurality of different telephone sets regardless of the particular electrical configuration and which records both incoming and outgoing messages.

DISCLOSURE OF INVENTION

10 According to one aspect of the invention, an adaptor is disclosed for use with a cellular telephone set having a hand set with a telephone modular plug releasably connected to a telephone modular jack in the telephone set. The adaptor has a housing and an
15 adaptor modular jack mounted in the housing which is adapted to receive the hand set modular plug. A plurality of output ports are electrically connected to the respective pins of the adaptor modular jack. A plurality of input ports are electrically connected to
20 respective ones of the plurality of output ports. An adaptor modular plug is connected to the input ports and is adapted to be plugged into the telephone set modular jack. A plurality of single pole switches are mounted in the housing. There is one switch for each
25 output port and the switches are divided into first and second sets. Each switch has a first and second side. A plurality of tap lines connect each output port to one side of the switches. A tape jack with two terminals has one terminal connected to the second side of the first set of terminals and the other terminal is
30 connected to the second side of the second set of switches. The plurality of output ports and input ports and the tape jack are also mounted in the housing.

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BRIEF DESCRIPTION OF DRAWINGS:

Preferred embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

5 Figure 1 is an exploded perspective view of a preferred embodiment of a telephone recording adaptor; and

Figure 2 is a circuit diagram of the telephone recording adaptor shown in Figure 1.

10 MODES FOR CARRYING OUT INVENTION

Referring firstly to Figure 1, a preferred embodiment of a telephone recording adaptor is generally indicated by reference numeral 10. Adaptor 10 has a circuit board 12 on which is mounted a conventional eight pin telephone modular output jack 14, a two pin tape recorder output jack 16, and an eight pin dip switch 18. A conventional eight pin telephone modular input plug 20 is electrically connected to circuit board 12 through an eight wire input line 22.

20 Upper and lower housing members 24, 26 enclose circuit board 12 and the components mounted thereon and have suitable access openings 28, 30, 32 for accessing respectively, output jacks 14, 16 and dip switch 18. A further access opening 34 permits input line 22 to enter the housing formed by housing members 24, 26.

25 Referring next to Figure 2, the circuit diagram for adaptor 10 is shown. A plurality of input ports 36 are provided to attach respective wires of input line 22 to printed circuit interconnection lines 38. Similarly, a plurality of output ports 40 connect modular output jack 14 to printed circuit interconnection lines 38. A plurality of tap lines 42 connect each interconnection line 38 to one of the single pole switches of dip switch 18 through

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respective capacitors 44. Capacitors 44 are 0.1 uf, 50 vdc capacitors.

It will be noted in Figure 2 that the output ports 40 are numbered from 1 to 8, as are tap lines 42, 5 the switches of dip switch 18 and the corresponding pins of jack 14 and plug 20. Pins 1 and 8 are first and last pins or ports and pins 2 through 7 are intermediate pins or ports. The switches of dip switch 18 are thus connected in parallel with input and 10 output ports 36, 40. If desired, the capacitors 44 for tap lines 1 and 8 can be eliminated, since these are ground lines, as discussed further below.

Tap lines 42 are connected to the first or input side of dip switch 18. Pins 1 and 8 of the 15 second or output side of dip switch 18 are wired together and are connected to one terminal, preferably the ground terminal of output jack 16. The remaining pins 2 through 7 of the output side of dip switch 18 are also wired together and are connected to the other 20 terminal of output jack 16. Dip switches 1 and 8 form one set of switches and dip switches 2 through 7 form a second set of switches.

In use, the adaptor 10 is placed in series 25 between the handset and the main power supply portion of a cellular telephone set. Modular plug 20 is the same type that is universally found on cellular telephone handsets, and modular jack 14 is the type that receives modular plug 20. Connected in this way with all of the switches of dip switch 18 open, adaptor 30 10 just acts as a patch cord and has no effect on the operation of the cellular telephone.

In order to record telephone signals using 35 adaptor 10, a plug from a tape recorder is inserted into jack 16 and one of the dip switches 1 and 8 is closed along with one of the dip switches 2 through 7. It has been discovered that cellular telephones having handset plug corresponding to plug 20 universally have

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pins 1 or 8 as a ground. It has further been discovered that at least one of pins 2 through 7 carry both the incoming and outgoing telephone or audio signals. Which switches of dip switch 18 should be closed will depend upon the particular make of cellular telephone and is a simple matter of trial and error to determine for any make of telephone. Capacitors 44 prevent any damage from being done by closing the incorrect switches of dip switch 18. With adaptor 10 configured in this way, a voice activated tape recorder connected to jack 16 will record all incoming and outgoing messages received or sent on the cellular telephone with which adaptor 10 is used.

Having described preferred embodiments, it will be appreciated that modifications can be made to the structure and circuitry of adaptor 10. For example, different types of plugs and jacks could be used, and of course, the number of wires or pins could vary. Printed circuit board 12 could be replaced with hard wiring, and input line 22 could be connected directly to output ports 40 as could tap lines 42. In this case, input ports 36 would be the same or co-terminus with output ports 40. Capacitors 44 could be eliminated, but instructions would have to be included with adaptor 10 to indicate how the switches of dip switch 18 should be set for particular makes of cellular telephones.

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WHAT IS CLAIMED IS:

1. An adaptor for use with a cellular telephone set having a hand set with a telephone modular plug releasably connected to a telephone modular jack in the telephone set, comprising:

a housing;

an adaptor modular jack (14) mounted in the housing and being adapted to receive said hand set modular plug;

a plurality of output ports (40) located in the housing and being electrically connected to respective pins of said adaptor modular jack (14);

a plurality of input ports (36) located in the housing and being electrically connected to respective ones of said output ports;

an adaptor modular plug (20) connected to said input ports (36) and being adapted to be plugged into said telephone set modular jack;

a plurality of single pole switches mounted in the housing, there being one switch for each output port, said switches being divided into first and second sets and having first and second sides;

a plurality of tap lines (42) connecting each output port to one side of one of said switches; and

a tape jack (16) mounted in the housing and having two terminals, one of said terminals being connected to the second sides of said first set of switches and the other terminal being connected to the second sides of said second set of switches.

2. An adaptor as claimed in claim 1 and further including a plurality of capacitors (44), one capacitor being connected in series between each of selected output ports (40) and the respective switches.

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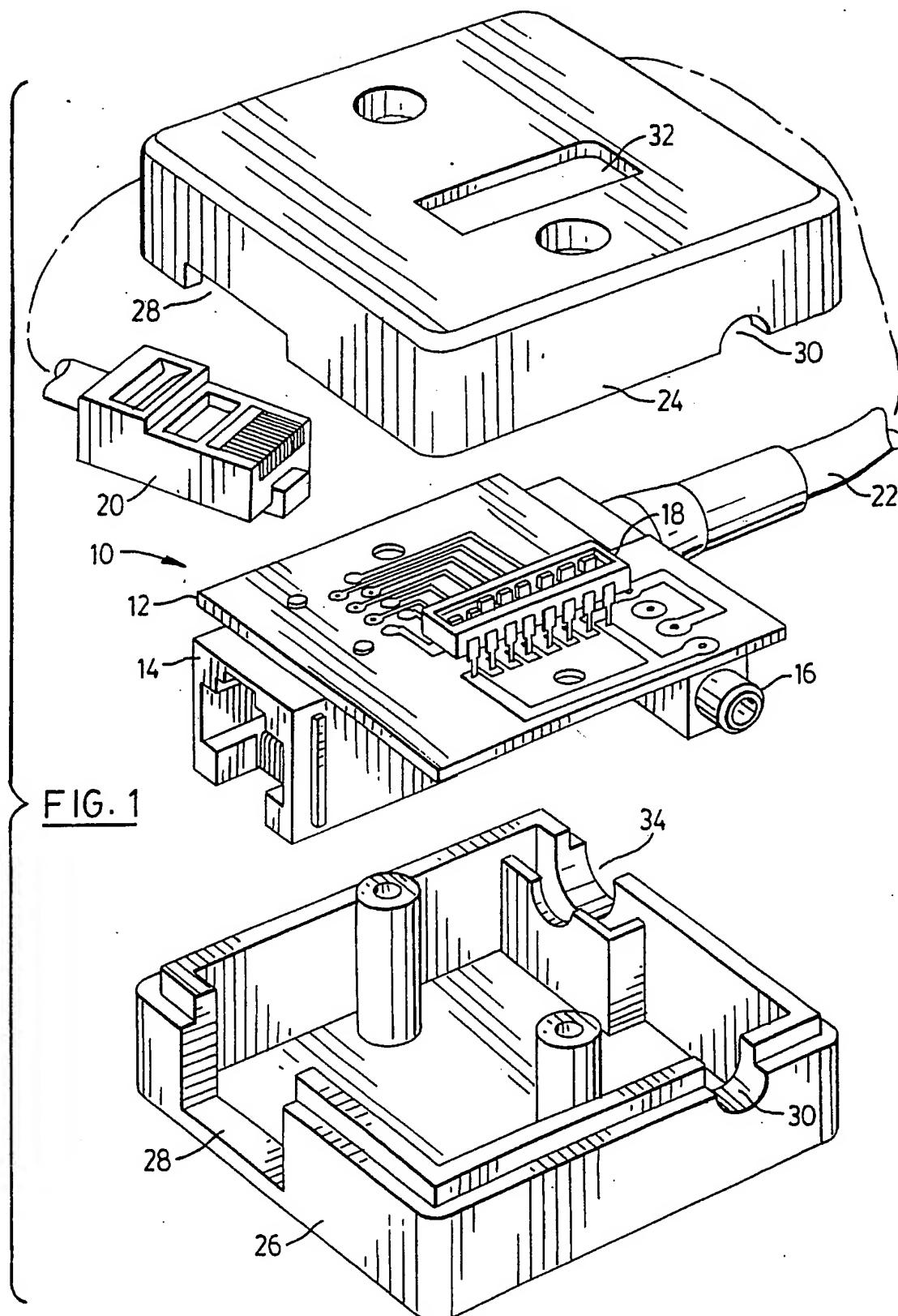
3. An adaptor as claimed in claim 2 wherein one of said capacitors (44) is connected between each output port and its respective switch.

4. An adaptor as claimed in claim 1 wherein said adaptor modular jack (14) has first, last and intermediate pins, said first and last pins being connected through said tap lines (42) to said first set of switches and said intermediate pins being connected through said tap lines to said second set of switches.

5. An adaptor as claimed in claim 1 wherein the adaptor modular plug (20) and jack (16) have 8 pins, there being a corresponding number of input and output ports, tap lines and switches.

6. An adaptor as claimed in claim 1 wherein said switches are part of a dip switch (18) mounted in said housing.

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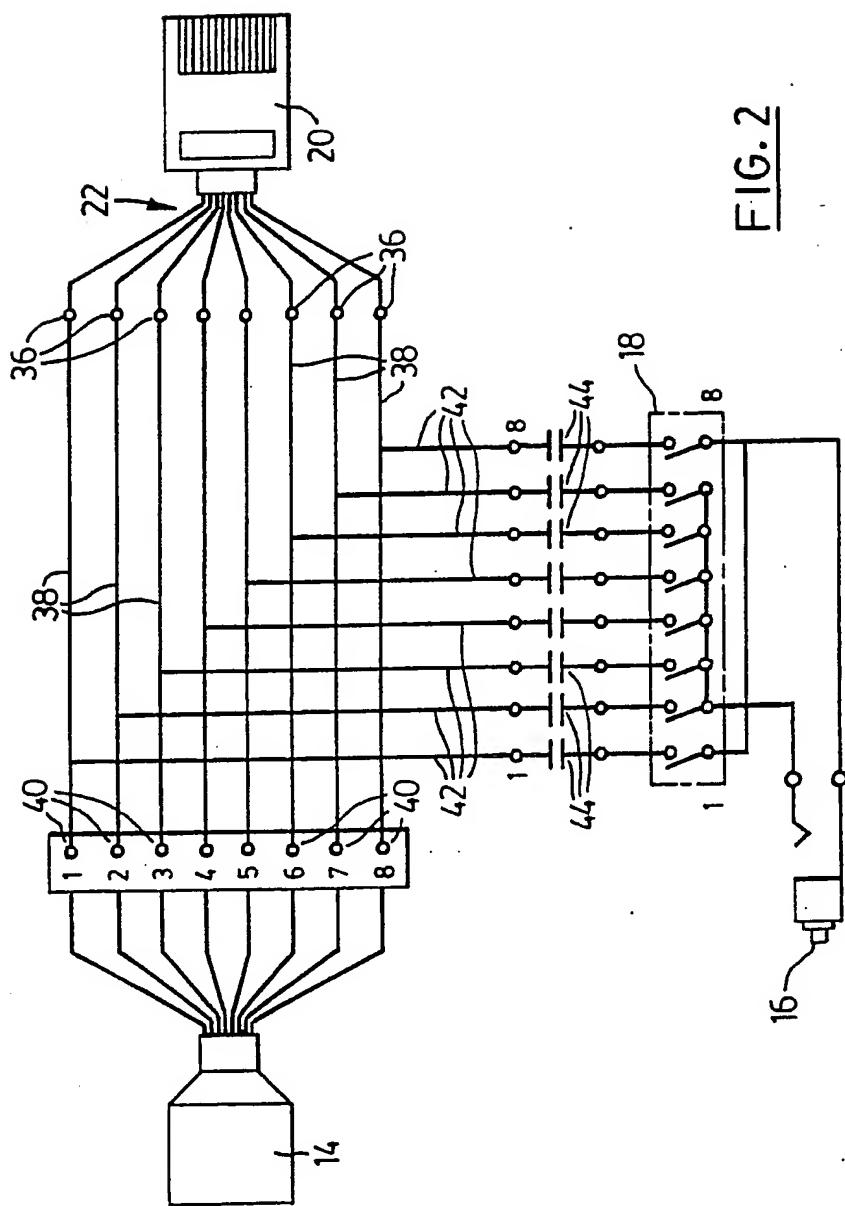


FIG. 2

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SUBSTITUTE SHEET

INTERNATIONAL SEARCH REPORT

International Application No PCT/CA 90/00305

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) *

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC⁵: H 04 M 1/00

II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC ⁵	H 04 M, H 04 Q, H 01 R

Documentation Searched other than Minimum Documentation
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III. DOCUMENTS CONSIDERED TO BE RELEVANT *

Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	US, A, 4362905 (ISMAIL) 7 December 1982 see figure 5; claims 1,2; column 1, lines 30-45 --	1
A	US, A, 4446335 (LEE et al.) 1 May 1984 see figure 1; column 4, lines 10-25; column 5, line 20 - column 6, line 27; claim 1 cited in the application	1

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IV. CERTIFICATION

Date of Actual Completion of the International Search

19th April 1991

Date of Mailing of this International Search Report

14.06.91

International Searching Authority

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Signature of Authorized Officer

Mme Dagmar FRANK

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

CA 9000305
SA 40055

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 10/06/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4362905	07-12-82	None	
US-A- 4446335	01-05-84	None	